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University of Saskatchewan
Department of Computer Science

CMPT 111.5 – Section 05 – Fraser
Midterm Examination
Nov 2, 2000

Answer all questions in the spaces provided on this exam paper. If you don't have enough space, write on the back of the page - clearly indicate that your answer is continued there. Be sure to pace yourself according to the marks allotted to each question.

This midterm exam is open book.
You may refer to your notes, any computer printouts, and your textbook. Computers and calculators are NOT permitted.

If you don't know the exact answer to a question, write as much you can.
Partial marks will be given.

Good Luck!

University of Saskatchewan
Department of Computer Science
CMPT 111.3 all sections Midterm Examination   Open Book / Open Mind
November 4th, 2004

Total Marks: 100   **Time: 90 minutes**

Answer questions 1-20 on the opt-scan sheet, all other questions in the spaces provided in this exam paper. If you don't have enough space, write on the back of the page, indicating clearly that your answer is continued there. Be sure to pace yourself according to the marks allotted to each question.

Part 1 (true/false, two marks each) put your responses on the opt-scan sheet

1   A (false)   B (true)   The following code assigns 10.5 to z.
```
int x = 21;
int y = 2;
double z = 21 / 2;
```

2   A (false)   B (true)   Java byte-code (the class file) must be recompiled when moved to a different machine.

3   A (false)   B (true)   Any for-loop could be re-written as a while-loop.

4   A (false)   B (true)   String is **NOT** a primative data type in Java.

5   A (false)   B (true)   The index of the first element in an array in Java is 1.

6   A (false)   B (true)   To compile the java program Midterm.java the command `javac Midterm.java` should be used.

7   A (false)   B (true)
```
for (int i=0;i<5;i++)
        System.out.println("hello");
System.out.println(i);
```
The above code will result in a compiler error.

8   A (false)   B (true)
```
int count=0;
while(count<2)
{
        count++;
}
System.out.println(count);
```
The value printed to the screen is 2.

9   A (false)   B (true)   A java class can only have one constructor.

10 A (false)   B (true)   To execute the java program Midterm the command `java Midterm.java` should be used.

8/ → 16   10 → 30   +43

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Part 2 (Multiple choice, three marks each) put your responses on the opt-scan sheet

11   Which of the following is a legal variable name in Java?
  A   Goforit!
  B   5timestables
  C   hic_cup
  D   sea&sky
  E   Void

12   Consider the following program fragment, and the options
      for a possible next line of the program. Which of
      the options is **NOT** a legal condition?

```
int i = 6;
boolean b = true;
String s = "89";
```
  A   if (b)
  B   if (s > i)
  C   if (b == true)
  D   if (s.equals("w"))
  E   if (i == 6)

13   Which of the following is a primitive data type in Java?
  A   void
  B   String
  C   double
  D   new
  E   Class

14   The following is **NOT** a logical operator in Java:
  A   !
  B ||
  C   &&
  D   >
  E   Actually, all of the above are logical operators.

15   We want the value "plusplus" to be stored in the
      brand-new variable s. Which of the following will
      accomplish this?
  A   int s = "plusplus";
  B   String s = "plus" "plus";
  C   String s += "plus";
  D   String s = new String("plusplus");
  E   String s = String.concat("plus");

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16   Consider the following program fragment.
Select the answer that best matches the output.

```
int i = 9;
for (i = 0; i < 3; i++)
    System.out.print("*");
System.out.println("");
```

A   *
B   * *
C   * * *
D   * * * *
E   No output

17   Consider the following program fragments.
Select the answer that best matches the output.

```
int a = 1, b = 2;
if ((a > b) || (b > a))
    a += b;
else
    a -= b;
System.out.println(a);
```

A   -1
B   0
C   1
D   2
E   3

18   Consider the following program fragment.
Select the answer that best matches the output.

```
int[] mya = new int[6];
for (int i = 0; i != mya.length; i++)
    mya[i] = i*5;
System.out.println(mya[5]);
```

A   0
B   5
C   6
D   25
E   The code will generate an error.

19   Consider the following method:

```
public int question(int a, int b)
{
    int c = a - b;
    if (b > c)
        return a;
    else
        return c;
}
```

What will be the returned value if we
make the call question(3,1);

A   -2
B   0
C   1
D   2
E   3

20   Consider the following program fragment.
Select the answer that best matches the output.

```
int a = 8, b = 5;
int c = b % a;
System.out.println(c);
```

A   0
B   5
C   8
D   13
E   40

Part 3 (Open questions) put your responses in the spaces provided on this paper

Question 21: (10 marks)

Money

Given the driver class UseWallet, write the code for the class Wallet (on the next page). The Wallet class should include a constructor, a subtractAmount method and a getAmount method. You may assume that all amounts are in whole dollars (no cents will be used).

Your subtractAmount method should return the amount of money that was subtracted, keeping in mind that the amount of money in the wallet should never be negative. So, if the amount of money being subtracted is more than the amount in the wallet then the subtractAmount method should not subtract any money.

Pseudocode for subtractAmount:
   if amount to subtract is less than or equal to amount in wallet
      subtract the money from the wallet, return the amount subtracted
   otherwise return zero

Remember to use the correct visibility modifiers.
You do not need to comment your code for this question.

```java
// This class is the driver class for MyWallet
// It creates a wallet and then performs some
// method calls on it.
public class UseWallet
{
    public static void main(String[] args)
    {
        int originalAmount = 100;
        int subtractAmount = 70;
        int returnedValue;

        Wallet myWallet = new Wallet(originalAmount);
        System.out.println("Original Amount: "+myWallet.getAmount() );

        returnedValue = myWallet.subtractMoney(subtractAmount);
        if(returnedValue == subtractAmount)
            System.out.println("New Amount: "+myWallet.getAmount() );
        else
            System.out.println("Not enough money left");
    }
}
```

```java
public class Wallet
{
    // Write your code here
    private int TotalAmount;
        public Wallet (int Amt)
        {
            TotalAmount = Amt;
        }

        Public int             SubtractMoney (int Value)
            if ( Value > Total Amount )
                return ;
            else
            {
            Total Amount = total amount - Value;
            return
            }

        Public int   getAmount()
            { return
            TotalAmount;
            }
}
```

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Question 22: (10 marks)

Beside each System.out.println statement write the program's output.
You should write the output after the comment symbol (//).

```java
public class StringTest
{
    public static void main(String[] args)
    {
        String  s1 = new String("Midterm Test");
        String  s2 = s1.toLowerCase();
        String  s3 = s1.toUpperCase();
        String  s4 = s1.substring(6);
        String  s5 = s1.substring(5, 9);
        String  s6 = s1 + s1;
        String  s7 = s1;
                s7 += " Today";
        boolean s8 = s1.equals("mIDTERM tEST");
        int     s9 = s1.indexOf("t");
        int     s10 = s1.length();

        System.out.println(s1);    // Midterm Test ✓

        System.out.println(s2);    // midterm test ✓

        System.out.println(s3);    // MIDTERM TEST ✓

        System.out.println(s4);    // M Test ✓

        System.out.println(s5);    // rM T ✓

        System.out.println(s6);    // Midterm TestMiderm Test ✓

        System.out.println(s7);    // Midterm Test Today ✓

        System.out.println(s8);    // false ✓

        System.out.println(s9);    // 3 ✓

        System.out.println(s10);   // 12
    }
}
```

9

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Question 23: (5 marks)

Circle five syntax errors in the following code that cause the program to not compile.
You may assume the code is contained in a file called MyClass.java

```java
import java.io.*;

public class MyClass

public static void main(String[] args) throws Exception
{
    BufferedReader kb = new BufferedReader(new
InputStreamReader(System.out));

    System.out.print("Please enter some text:);

    String input = kb.readLine;
    if(input.equals("Special")
    {
        System.out.println("You entered some special text");
    }
    else
    {
        System.out.println("The text you entered was: "+input !!!");
    }
}
```

Question 24: (5 marks)

Given the code:

```java
int x=9;
int y=8;
boolean s=true;
BogusClass bc=new BogusClass("bogus","class");
String value=bc.doSomethingWith(s,y,x);
```

What would the header of the method doSomethingWith look like? (4 marks)

public String doSomething With(boolean a, int b, int c)

What is the name of the class in which the doSomethingWith method is defined? (1 mark)

Bogus Class

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Question 25 (5 marks)

What is the output of the following code?

(Hint trace the values of all the variables)

```
int y=26;
int x=3;
int d=0;
for (int i=0;i<y/4;i=i+3)
{
        int u=y/x;
        d=d+x+u;
        x=u;
}
System.out.println("x=" + x + " d="+d);
```

(handwritten: 26, 3, 8, 0, 6)

(handwritten: U = 8, 3)

(handwritten: 22)

(handwritten: 8, 3)

(handwritten) X = 3   d = 22 ✓ 5

Question 26: (5 marks)

Given the method

```
public int returnMagicNumber(int[] a)
{
        int x=a[0];
        for (int i=1;i<a.length;i++)
                if (a[i]>x)
                        x=a[i];
        return x;
}
```

What would the the following code have as output? (5 marks total)

```
int[] y={13,2,6,7,19,4,6};
System.out.println(returnMagicNumber(y));
```

(handwritten: 6   19)

```
int[] z={5,4,22,-7,60,69,1,0};
System.out.println(returnMagicNumber(z));
```

(handwritten: 5   69)

Question 27:(5 marks)

The code below is supposed to determine the minimum amount of quarters(25 cent coins), dimes (10 cent coins), nickels (5 cent coins) and pennies (1 cent coins) that are needed to pay the amount represented by the variable money (in dollars). You can use all the blanks, but you don't have to.

```
double money=1.67;
int total=_____2_____
int quarters=_____money / 0.25_____

int dimes=_____(money - (quarters)*0.25) / 0.1_____

int nickels=_____(money-(quarters*0.25) - ((dimes)*0.1)) / 0.05_____

int pennies=_____(money - (quarters*0.25) - (dimes*0.1) - (nickles*0.05)) / 0.01_____
```
ugly, but ok

5/

Question 28: (5 marks)

Given the 2 classes below, what is the output of executing the Drawing program?

```
class Crayon
{
        private String colour;

        public Crayon();
        {
                colour=new String();
        }
        public void setColour(String c);
        {
                colour=c;
        }
        public String getColour()
        {
                return colour;
        }
}


class Drawing
{
        public static void main(String[] a)
        {
                Crayon c=new Crayon();
                Crayon d=new Crayon();
                Crayon e=new Crayon();
                e.setColour("blue");
                d.setColour("yellow");
                c.setColour("red");
                System.out.println(c.getColour());    // output 1
                System.out.println(d.getColour());    // output 2
                System.out.println(e.getColour());    // output 3
                d.setColour(c.getColour());
                e.setColour(d.getColour());
                System.out.println(d.getColour());    // output 4
                System.out.println(e.getColour());    // output 5
        }
}
```

Answers:

output 1 ___red___ ✓

output 2 ___yellow___ ✓

output 3 ___blue___ ✓

output 4 ___red___ ✓

output 5 ___red___ ✓

5

****** THE END ******

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